

CLAIMS

What is claimed is:

1. An apparatus for identifying matching items, the apparatus comprising:
an associative memory bank, including an ordered plurality of entries, for
5 generating matching indication signals for each matching entry of the ordered plurality of
entries that matches a lookup value; and
a merging mechanism, coupled to the matching mechanism, for identifying a
winning entry from said matching entries, wherein each of the ordered plurality of entries
is associated with (a) one of an ordered plurality of groups and (b) a skip or a no-skip
10 condition, and wherein the merging mechanism selects the winning entry based on said
matching indication signals; wherein said selecting the winning entry includes identifying
as the winning entry an entry of said matching entries first in the priority ordering of the
ordered plurality of entries that is not in a group that is skipped, wherein a particular
group is skipped if the highest priority matching entry of the particular group is associated
15 with a skip condition.
2. The apparatus of claim 1, comprising one or more banks of one or more storage
elements for identifying for each particular entry of the plurality of entries: (a) the
associated skip or no-skip condition, and (b) whether or not said particular entry is first in
20 the order sequence of one of the ordered plurality of groups.
3. The apparatus of claim 1, wherein each of the plurality of groups corresponds to
a different access control list.
4. The apparatus of claim 1, wherein the merging mechanism includes circuitry
for identifying and masking skipped entries of said matching entries.

5. An apparatus for identifying matching items, the apparatus comprising:
an associative memory bank, including an ordered plurality of entries, for
generating matching indication signals for each matching entry of the ordered plurality of
entries that matches a lookup value; and
- 5 a merging mechanism, coupled to the matching mechanism, for identifying a
winning entry from said matching entries, wherein each of the ordered plurality of entries
is associated with (a) one of an ordered plurality of hierarchical first groups, (b) one of an
ordered plurality of hierarchical second groups, (c) a skip or a no-skip first-level
condition, and (d) a skip or a no-skip second-level condition, and wherein the merging
10 mechanism selects the winning entry based on said matching indication signals; wherein
said selecting the winning entry includes identifying as the winning entry an entry of said
matching entries first in the priority ordering of the ordered plurality of entries that is not
in a group of the hierarchical first or second groups that is skipped, wherein a particular
first group of the first hierarchical groups is skipped if the highest priority matching entry
15 of the particular first group is associated with a skip first-level condition, and a particular
second group of the second hierarchical groups is skipped if the highest priority matching
entry of the particular second group is associated with a skip second-level condition.
6. The apparatus of claim 5, comprising one or more banks of one or more storage
elements for identifying for each particular entry of the plurality of entries: (a) the
20 associated skip or no-skip first-level condition, (b) the associated skip or no-skip
second-level condition, (c) whether or not said particular entry is first in the order
sequence of one of the ordered plurality of hierarchical first groups, and (c) whether or
not said particular entry is first in the order sequence of one of the ordered plurality of
hierarchical second groups.
- 25 7. The apparatus of claim 5, wherein each of the plurality of groups corresponds to
a different access control list.

8. The apparatus of claim 5, wherein the merging mechanism includes circuitry for identifying and masking skipped entries of said matching entries.

9. A method for identifying matching items, the method comprising:

receiving indications of entries matched during a lookup operation on an ordered
5 plurality of entries of an associative memory bank, wherein each of the ordered plurality of entries is associated with (a) one of an ordered plurality of groups and (b) a skip or a no-skip condition; and

identifying as a winning entry an entry of said matching entries first in the priority
ordering of the ordered plurality of entries that is not in a group that is skipped, wherein a
10 particular group is skipped if the highest priority matching entry of the particular group is associated with a skip condition.

10. The method of claim 9, wherein said identifying as the winning entry includes masking one or more of said received indications of said matching entries of in a group that is skipped.

11. An apparatus for identifying matching items, the apparatus comprising:

15 means for receiving indications of entries matched during a lookup operation on an ordered plurality of entries, wherein each of the ordered plurality of entries is associated with (a) one of an ordered plurality of groups and (b) a skip or a no-skip condition; and

20 means for identifying as a winning entry an entry of said matching entries first in the priority ordering of the ordered plurality of entries that is not in a group that is skipped, wherein a particular group is skipped if the highest priority matching entry of the particular group is associated with a skip condition.

12. The apparatus of claim 11, wherein said means for identifying as the winning
25 entry includes means for masking one or more of said received indications of said matching entries of in a group that is skipped.

13. A computer-readable medium containing computer-executable instructions for performing steps for identifying matching items, said steps comprising:

receiving indications of entries matched during a lookup operation on an ordered plurality of entries of an associative memory bank, wherein each of the ordered plurality
5 of entries is associated with (a) one of an ordered plurality of groups and (b) a skip or a no-skip condition; and

identifying as a winning entry an entry of said matching entries first in the priority ordering of the ordered plurality of entries that is not in a group that is skipped, wherein a particular group is skipped if the highest priority matching entry of the particular group is
10 associated with a skip condition.

14. The computer-readable medium of claim 13, wherein said identifying as the winning entry includes masking one or more of said received indications of said matching entries of in a group that is skipped.

15. A method for identifying matching items, the method comprising:

15 receiving indications of entries matched during a lookup operation on an ordered plurality of entries of an associative memory bank, wherein each of the ordered plurality of entries is associated with (a) one of an ordered plurality of hierarchical first groups, (b) one of an ordered plurality of hierarchical second groups, (c) a skip or a no-skip first-level condition, and (d) a skip or a no-skip second-level condition; and

20 identifying as the winning entry an entry of said matching entries first in the priority ordering of the ordered plurality of entries that is not in a group of the hierarchical first or second groups that is skipped, wherein a particular first group of the first hierarchical groups is skipped if the highest priority matching entry of the particular first group is associated with a skip first-level condition, and a particular second group of
25 the second hierarchical groups is skipped if the highest priority matching entry of the particular second group is associated with a skip second-level condition.

16. The method of claim 15, wherein said identifying as the winning entry includes masking one or more of said received indications of said matching entries of in a group that is skipped.

17. An apparatus for identifying matching items, the apparatus comprising:
5 means for receiving indications of entries matched during a lookup operation on an ordered plurality of entries of an associative memory bank, wherein each of the ordered plurality of entries is associated with (a) one of an ordered plurality of hierarchical first groups, (b) one of an ordered plurality of hierarchical second groups, (c) a skip or a no-skip first-level condition, and (d) a skip or a no-skip second-level
10 condition; and
means for identifying as the winning entry an entry of said matching entries first in the priority ordering of the ordered plurality of entries that is not in a group of the hierarchical first or second groups that is skipped, wherein a particular first group of the first hierarchical groups is skipped if the highest priority matching entry of the particular
15 first group is associated with a skip first-level condition, and a particular second group of the second hierarchical groups is skipped if the highest priority matching entry of the particular second group is associated with a skip second-level condition.

18. The apparatus of claim 17, wherein said means for identifying as the winning entry includes means for masking one or more of said received indications of said
20 matching entries of in a group that is skipped.

19. A computer-readable medium containing computer-executable instructions for performing steps for identifying matching items, said steps comprising:

receiving indications of entries matched during a lookup operation on an ordered plurality of entries of an associative memory bank, wherein each of the ordered plurality of entries is associated with (a) one of an ordered plurality of hierarchical first groups, (b) one of an ordered plurality of hierarchical second groups, (c) a skip or a no-skip first-level condition, and (d) a skip or a no-skip second-level condition; and

identifying as the winning entry an entry of said matching entries first in the priority ordering of the ordered plurality of entries that is not in a group of the hierarchical first or second groups that is skipped, wherein a particular first group of the first hierarchical groups is skipped if the highest priority matching entry of the particular first group is associated with a skip first-level condition, and a particular second group of the second hierarchical groups is skipped if the highest priority matching entry of the particular second group is associated with a skip second-level condition.

20. The computer-readable medium of claim 19, wherein said identifying as the winning entry includes masking one or more of said received indications of said matching entries of in a group that is skipped.